LISTING OF CLAIMS

Claim 1 (Currently Amended):   A method of implementing atomic transactions in a system, said method comprising:

requesting in a user program a transaction identifier for an atomic transaction;

generating said transaction identifier in a transaction manager in response to said requesting;

specifying in said user program a plurality of combinations, wherein each of said plurality of combinations contains said transaction identifier, a task procedure, and a rollback procedure,

wherein the combination indicates that the rollback procedure is to be executed if the execution of the corresponding task procedure in the combination is completed and if said atomic transaction is to be aborted,

wherein said task procedure implements a part of said atomic transaction and said rollback procedure is designed to rollback said task procedure;

executing a set of task procedures in a sequential order according to said user program, wherein said set of task procedures are contained in said task procedures specified in said plurality of combinations;

keeping track of a set of rollback procedures corresponding to said set of task procedures, each of said set of rollback procedures being determined based on a combination corresponding to an executed task procedure contained in said set of task procedures, said combination being contained in said plurality of combinations specified in said user program, wherein said set of rollback procedures are kept track of external to said user program in response to said executing of the corresponding task procedures; and

executing said set of rollback procedures in a reverse order of said sequential order if said atomic transaction is to be aborted,

wherein said rollback procedure is specified as a separate procedure from said task procedure in said user program,

wherein said user program contains groups of instructions to implement respective program logic for each of said task procedure and said rollback procedure, and

whereby each user program has corresponding custom logic specified by a user for each of the rollback procedures.

Claim 2 (Original): The method of claim 1, wherein said transaction identifier is unique to each of the atomic transactions.

Claim 3 (Previously Presented): The method of claim 1, wherein said keeping comprises storing data representing said rollback procedures in a stack.

Claim 4 (Original): The method of claim 3, wherein said stack is stored in a memory.

Claim 5 (Previously Presented): The method of claim 1, wherein said user program further comprises additional instruction for examining a status returned by execution of one of said task procedures and performing said aborting if said status indicates an error,

wherein said aborting is specified in said user program using an instruction containing said transaction identifier.

Claim 6 (Original): The method of claim 1, wherein said aborting is performed asynchronously.

Claim 7 (Currently Amended):   A computer readable storage medium carrying one or more sequences of instructions representing a user program for execution on a system, said user program implementing an atomic transaction, wherein execution of said one or more sequences of instructions by one or more processors contained in said system causes said system to perform the actions of:

requesting an identifier in said user program from a transaction manager for said atomic transaction, said transaction manager being provided external to said user program, wherein said transaction manager generates a unique value as said identifier and provides said identifier to said user program;

setting a variable to equal said identifier in said user program;

specifying a plurality of combinations in said user program for execution in said system, wherein each of said plurality of combinations contains said variable, a task procedure, and a rollback procedure,

wherein the combination indicates in said user program that the rollback procedure is to be executed if the execution of the corresponding task procedure in the combination is completed and if said atomic transaction is to be aborted,

wherein said task procedure implements a part of said atomic transaction and said rollback procedure is designed to rollback said task procedure, wherein said variable in each of said plurality of combinations specifies said identifier generated by said transaction manager;

executing a set of task procedures in a sequential order, wherein said set of task procedures are contained in said task procedures specified in said plurality of combinations; and

aborting said atomic transaction by specifying, in said user program, said identifier associated with an abort procedure to cause ~~said~~ a set of rollback procedures to be executed in a reverse order of said sequential order, each of said set of rollback procedures being determined based on a combination corresponding to an executed task procedure contained in said set of task procedures,

wherein said plurality of combinations and said abort procedure are contained in said user program,

wherein said user program contains groups of instructions to implement respective program logic for each of said task procedure and said rollback procedure, and

whereby each user program has corresponding custom logic specified by a user for each of the rollback procedures.

Claim 8 (Previously Presented): The computer readable storage medium of claim 7, wherein said specifying comprises including each of said plurality of combinations in a single procedure call.

Claim 9 (Previously Presented): The computer readable storage medium of claim 7, further comprising examining a status returned by execution of one of said task procedures and performing said aborting if said status indicates an error.

Claim 10 (Currently Amended):   A computer readable storage medium carrying one or more sequences of instructions for supporting implementation of a transaction manager which supports an atomic transaction in a user program executing in a system, wherein execution of said one or more sequences of instructions by one or more processors contained in said system causes said system to perform the actions of:

generating an identifier for said atomic transaction for [a] said user program;

providing said identifier to said user program;

receiving a plurality of combinations for execution from said user program, wherein each of said plurality of combinations contains said transaction identifier, a task procedure, and a rollback procedure,

wherein the combination indicates that the rollback procedure is to be executed if the execution of the corresponding task procedure in the combination is completed and if said atomic transaction is to be aborted,

wherein said task procedure implements a part of said atomic transaction and said rollback procedure is designed to rollback said task procedure;

executing a set of task procedures in a sequential order according to said user program, wherein said set of task procedures are contained in said task procedures specified in said plurality of combinations;

keeping track of a set of rollback procedures corresponding to said set of task procedures, each of said set of rollback procedures being determined based on a combination corresponding to an executed task procedure contained in said set of task procedures, said combination being contained in said plurality of combinations specified in said user program; and

executing said set of rollback procedures in a reverse order of said sequential order in response to receiving an abort request, said abort request being received from said user program and containing said identifier,

wherein said rollback procedure is specified as a separate procedure from said task procedure in said user program,

wherein said user program contains groups of instructions to implement respective program logic for each of said task procedure and said rollback procedure, and

whereby each user program has corresponding custom logic specified by a user for each of the rollback procedures,

wherein said transaction manager is provided external to user programs including said user program.

Claims 11 - 12 (Canceled)

Claim 13 (Previously Presented): The computer readable storage medium of claim 10, wherein said transaction identifier is generated to be unique for each atomic transaction.

Claim 14 (Previously Presented): The computer readable storage medium of claim 10,

wherein said set of rollback procedures are represented in the form of a stack.

Claim 15 (Previously Presented): The computer readable storage medium of claim 14, wherein said stack is stored in a memory.

Claim 16 (Currently Amended): A computer system comprising:

a memory storing a plurality of instructions; and

a processing unit coupled to said memory and executing said plurality of instructions;

a computer readable medium to store and provide said plurality of instructions to said memory, wherein execution of said plurality of instructions by said processing unit causes said computer system to support implementation of atomic transactions in a programming environment by performing the actions of:

request in a user program, a transaction identifier for an atomic transaction;

generate said transaction identifier in a transaction manager in response to said requesting, wherein said transaction manager is provided external to said user program;

specify in said user program a plurality of combinations wherein each of said plurality of combinations contains said transaction identifier, a task procedure, and a rollback procedure, wherein the combination indicates in said user program that the rollback procedure is to be executed if the execution of the corresponding task procedure in the combination is completed and if said atomic transaction is to be aborted, wherein said task procedure implements a part of said atomic transaction and said rollback procedure is designed to rollback said task procedure, wherein said rollback procedure is specified as a separate procedure from said task procedure;

execute a set of task procedures in a sequential order according to said user program, wherein said set of task procedures are contained in said task procedures specified in said plurality of combinations;

keep track of a set of rollback procedures corresponding to said set of task procedures, each of said set of rollback procedures being determined based on a combination corresponding to an executed task procedure contained in said set of task procedures, said combination being contained in said plurality of combinations specified in said user program, wherein said set of rollback procedures are kept track of external to said user program in response to said executing of the corresponding task procedures; and

execute said set of rollback procedures in a reverse order of said sequential order if said

atomic transaction is to be aborted, wherein said rollback procedures are identified according to said keeping,

wherein said user program contains groups of instructions to implement respective program logic for each of said task procedure and said rollback procedure, and

whereby each user program has corresponding custom logic specified by a user for each of the rollback procedures.

Claim 17 (Original): The computer system of claim 16, wherein said transaction identifier is unique to each of the atomic transactions.

Claim 18 (Previously Presented): The computer system of claim 16, wherein the actions performed by said computer system further comprise store data representing said rollback procedures in a stack to perform said keep.

Claim 19 (Original): The computer system of claim 18, wherein said stack is stored in a memory.

Claim 20 (Previously Presented): The computer system of claim 16, wherein the actions performed by said computer system further comprise examine a status returned by execution of one of said task procedures and to perform said aborting if said status indicates an error.

Claim 21 (Previously Presented): The computer system of claim 16, wherein the actions performed by said computer system further comprise execute said rollback procedures asynchronously.

Claims 22 - 24 (Canceled)

Claim 25 (Previously Presented): The computer readable storage medium of claim 7, wherein said rollback procedure is specified as a separate procedure from said task procedure in said user program.